

# THE CUSHMAN CHUCK COMPANY

ESTABLISHED 1862

HARTFORD, CONN., U.S.A.  
Manufacturers of ChucksCable Address  
"CUSHMAN" Hartford  
Iron Age Code on page 8Other Codes Used  
Western Union  
Lieber's**Products**

LATHE AND DRILL CHUCKS

**Quality**

Our many years' experience, together with our use of modern methods, has enabled us to produce at a moderate price chucks that are every one guaranteed to be satisfactory in all respects.

**Outfits for Lathes**

While the selection of proper chuck equipment for a lathe naturally depends upon the class of work to be done, we find it practical to recommend that a lathe should, in general, be equipped with two chucks, one as large as the capacity of the lathe will allow, the other of smaller size, preferably about half the capacity of the large chuck.

The large chuck should have four jaws, each working independently of the others, and these jaws should be solid and reversible, as, for example, our Independent 4-Jaw Chuck, Fig. 1. This chuck should be used for holding pieces of considerable weight or irregular shape either for rough turning or boring or for finishing.

The smaller chuck should have three jaws working together, and there should be two sets of jaws, one for holding disc-shaped pieces, and the other for holding rods and drills. Our Universal Geared Scroll Chuck, Style B34, Fig. 2, is ideal for this purpose. This chuck will hold round pieces firmly and centrally.

We believe that a lathe provided with this equipment is prepared to do any kind of work within its capacity for which chucks can be used at all.

This outfit of two chucks should prove much more satisfactory than a combination chuck of the same capacity.

A Universal Chuck will hold best if made with an odd number of jaws, preferably three. A four-jaw chuck may be used but unless the pieces to be held are perfectly round the four jaws will not bear equally, and two opposite jaws will have to take all the strain. If four jaws must be employed, then an Independent Chuck is generally better, as all the jaws may be adjusted to bear with equal pressure.

**Fitting Lathe Chucks**

Most of our lathe chucks are fitted to the machine by means of an intermediate flange plate, which is first threaded to fit the spindle and then, after being put on the spindle, is sized to fit the recess in the back of the chuck. Bolt holes are next drilled in the plate to correspond with those in the chuck; however, they should be slightly larger in diameter. In this way the flange plate is easily made, and if the work is done carefully the chuck will run true.

In fitting large chucks to the spindle it is often found advantageous to reverse the flange plate and let the hub extend into the chuck. This brings the chuck closer to the spindle bearing.

**Cushman Independent 4-Jaw Chucks (Style B12)**

This type of chuck is designed for holding pieces of any shape, each jaw being operated independently of the others. It is heavy in construction, and the body is made of high quality grey iron.

The recess for flange plate is of large diameter, so that when the flange plate is bolted to the chuck body, additional strength and rigidity are obtained.

The ribs on which the jaws slide are made unusually large and will stand heavy strains without breakage or excessive wear.

The jaws are made of open-hearth steel, case hardened, and are carefully fitted to the chucks. They are of one piece construction and can be easily reversed by running them out of the body and turning them end for end.

The screws are made of steel with heavy square threads extending throughout their entire length.

These chucks are fitted to the machine by means of a flange plate or adapter, the body of the chuck being recessed and drilled for the purpose. We can furnish castings from which these adapters can be easily made, or we can make

the finished adapter if the spindle dimensions are furnished us.

This type of chuck is so designed that it will hold pieces from 1 to 4 in. (25 to 101 mm.) larger than its rated

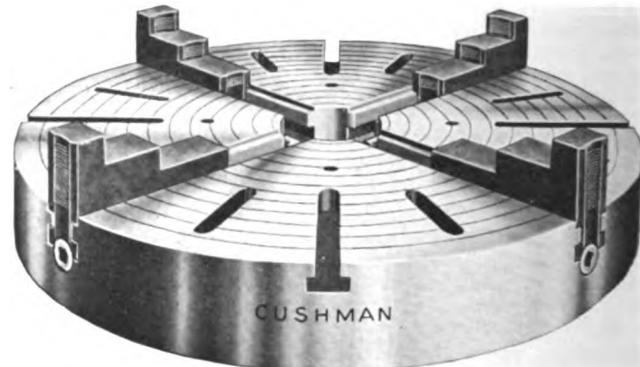


FIG. 1. CUSHMAN INDEPENDENT 4-JAW CHUCK  
STYLE B12

capacity. The jaws may be run out farther than this but in so doing some of the jaw teeth become disengaged, which puts a greater strain on those left in mesh. In general, the safe capacity of the chuck is but little greater than the size of the chuck body.

For machines doing larger work than our 36 in. (914 mm.) chuck will handle, we have a line of face plate jaws which serve every purpose.

We also carry chucks for special service where unusual holding power and relatively small size is required. These chucks are of approximately the same dimensions as the regular chucks described above, but the body is made of cast steel of great tensile strength.

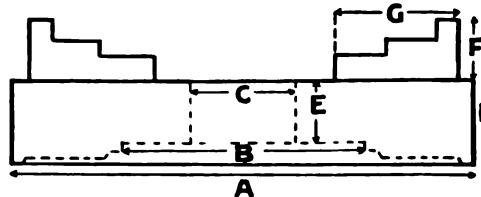


TABLE I. SPECIFICATIONS FOR STYLE B12 CHUCK

Size, A in. mm.	B in. mm.	C in. mm.	D in. mm.	E in. mm.	F in. mm.	G in. mm.	Weight lb. kg.
4 $\frac{1}{2}$ 114	4 $\frac{1}{8}$ 105	1 25.4	2 $\frac{1}{4}$ 55.5	2 50.8	7 $\frac{1}{4}$ 22.2	2 $\frac{1}{4}$ 57.2	8 3.63
6 152	5 $\frac{1}{8}$ 143	1 $\frac{1}{8}$ 39.6	2 $\frac{1}{4}$ 55.5	2 50.8	1 $\frac{1}{4}$ 31.8	2 $\frac{1}{2}$ 63.5	14 6.35
8 203	4 $\frac{1}{8}$ 121	1 $\frac{3}{4}$ 44.4	2 $\frac{1}{4}$ 69.9	2 $\frac{1}{4}$ 63.5	1 $\frac{1}{4}$ 34.9	3 $\frac{1}{4}$ 82.6	30 13.6
9 229	4 $\frac{1}{8}$ 121	1 $\frac{3}{4}$ 44.4	2 $\frac{1}{4}$ 69.9	2 $\frac{1}{4}$ 63.5	1 $\frac{1}{4}$ 34.9	3 $\frac{1}{4}$ 82.6	35 15.9
10 254	5 $\frac{1}{8}$ 143	2 50.8	3 $\frac{1}{4}$ 82.6	2 $\frac{1}{4}$ 69.9	1 $\frac{1}{4}$ 39.7	3 $\frac{1}{4}$ 88.9	42 19.1
12 305	6 $\frac{1}{8}$ 170	2 $\frac{1}{4}$ 69.8	3 $\frac{1}{4}$ 88.9	2 $\frac{1}{4}$ 73.0	2 50.8	4 102	70 31.8
14 356	6 $\frac{1}{8}$ 170	3 76.2	3 $\frac{1}{4}$ 88.9	2 $\frac{1}{4}$ 73.0	2 50.8	4 102	90 40.8
15 381	7 $\frac{1}{8}$ 198	3 76.2	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 73.0	2 50.8	4 $\frac{1}{2}$ 114	105 47.6
16 406	7 $\frac{1}{8}$ 198	3 76.2	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 73.0	2 50.8	4 $\frac{1}{2}$ 114	120 54.4
18 457	9 $\frac{1}{2}$ 241	4 102	4 $\frac{1}{4}$ 105	3 $\frac{1}{4}$ 88.9	2 $\frac{1}{4}$ 61.9	5 $\frac{1}{4}$ 130	160 72.6
20 508	9 $\frac{1}{2}$ 241	4 102	4 $\frac{1}{4}$ 105	3 $\frac{1}{4}$ 88.9	2 $\frac{1}{4}$ 61.9	5 $\frac{1}{4}$ 130	200 90.7
22 559	11 279	5 127	4 $\frac{1}{4}$ 111	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 61.9	5 $\frac{1}{4}$ 140	240 109
24 610	11 279	5 127	4 $\frac{1}{4}$ 117	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 66.7	5 $\frac{1}{4}$ 146	285 129
26 660	12 305	5 127	4 $\frac{1}{4}$ 117	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 66.7	6 152	310 141
28 711	13 330	5 127	4 $\frac{1}{4}$ 117	3 $\frac{1}{4}$ 92.1	2 $\frac{1}{4}$ 66.7	6 152	335 155
30 762	15 381	5 127	5 $\frac{1}{4}$ 130	3 $\frac{1}{4}$ 98.4	2 $\frac{1}{4}$ 79.4	7 $\frac{1}{4}$ 197	440 200
32 813	15 381	5 127	5 $\frac{1}{4}$ 133	3 $\frac{1}{4}$ 98.4	3 $\frac{1}{4}$ 79.4	7 $\frac{1}{4}$ 197	525 238
34 864	17 $\frac{1}{2}$ 451	6 152	5 $\frac{1}{4}$ 133	3 $\frac{1}{4}$ 98.4	3 $\frac{1}{4}$ 79.4	7 $\frac{1}{4}$ 197	575 261
36 914	17 $\frac{1}{2}$ 451	6 152	5 $\frac{1}{4}$ 140	3 $\frac{1}{4}$ 98.4	3 $\frac{1}{4}$ 79.4	7 $\frac{1}{4}$ 197	600 272

TABLE II. CODE TABLE FOR CHUCKS AS LISTED ABOVE

Size in. (mm.)	Code word	Size, in. (mm.)	Code word	Size, in. (mm.)	Code word
4 $\frac{1}{2}$ (114)	ACCEDE	15 (318)	ACCURATE	26 (660)	ACTOR
6 (152)	ACCESS	16 (406)	ACHE	28 (711)	ACTUAL
8 (203)	ACCIDENT	18 (457)	ACID	30 (762)	ACUTE
9 (229)	ACCLAIM	20 (508)	ACORN	32 (813)	ACTIVE
10 (254)	ACCORD	22 (559)	ACROSS	34 (864)	ACTRESS
12 (305)	ACCOST	24 (610)	ACTION	36 (914)	ACUMEN
14 (356)	ACCREDIT				

### Cushman Universal Geared Scroll Chucks

These are strictly Universal Chucks, the jaws being moved simultaneously by a scroll threaded disc. This scroll is revolved by pinion gears to which the key or wrench is directly applied.

The bodies, of gray iron, are very heavy and strong. The ribs on which the jaws slide are unusually large and will withstand heavy strains without breaking.

The steel jaws are carefully fitted to the body, and the curved teeth, since they are made by special machinery, will fit the scroll thread properly in any and every position of the jaws. They are carefully hardened and ground true on all the various steps. These jaws are not reversible.

The scroll is made from a steel forging and the pinion gears from bar steel. These parts are of such shape that they will stand the hardest service without perceptible wear.

Cushman Scroll Chucks are to be fitted to the machine by means of an intermediate flange plate adapter, the back of the chuck being recessed for the purpose. With every chuck we furnish bolts or screws for attaching.

The jaw slots are made to a standard size for each separate diameter of body, so that the jaws for any size of chuck are interchangeable. The bites of the jaws, however, are ground true after the jaws are hardened and placed in their respective slots in the chuck.

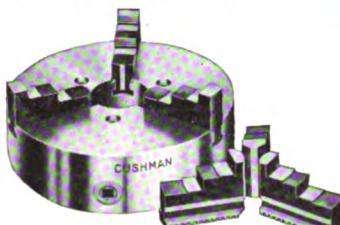


FIG. 2. STYLE B34 (3-JAW)

TABLE III. APPROXIMATE DIMENSIONS  
ALL UNIVERSAL SCROLL CHUCKS

Nominal size in.	Diameter of hole mm.	Diameter flange plate recess		Weight		Distance bottom of recess to face	
		in.	mm.	lb.	kg.	in.	mm.
3	78	5 <sup>1</sup> / <sub>2</sub>	15.9	27 <sup>1</sup> / <sub>2</sub>	73.0	21 <sup>1</sup> / <sub>2</sub>	1.13
4	101	1	25.4	3 <sup>1</sup> / <sub>2</sub>	77.8	6 <sup>1</sup> / <sub>2</sub>	2.95
5	127	1 <sup>1</sup> / <sub>4</sub>	31.8	3 <sup>1</sup> / <sub>2</sub>	95.3	9 <sup>3</sup> / <sub>4</sub>	4.42
6	152	1 <sup>1</sup> / <sub>2</sub>	39.7	4 <sup>1</sup> / <sub>2</sub>	121	15	6.80
7 <sup>1</sup> / <sub>2</sub>	191	2	50.8	4 <sup>1</sup> / <sub>2</sub>	121	26	11.8
9	220	2 <sup>1</sup> / <sub>2</sub>	63.5	5 <sup>1</sup> / <sub>2</sub>	143	36	16.3
10 <sup>1</sup> / <sub>2</sub>	267	3	76.2	5 <sup>1</sup> / <sub>2</sub>	143	48	21.8
12	305	3	76.2	7	178	71	32.2
15	381	3 <sup>1</sup> / <sub>4</sub>	82.6	7	178	119	54.0
18	457	3 <sup>1</sup> / <sub>4</sub>	82.6	9 <sup>1</sup> / <sub>2</sub>	241	141	63.9
21	583	3 <sup>1</sup> / <sub>4</sub>	82.6	9 <sup>1</sup> / <sub>2</sub>	241	194	88.0

### Jaws for Cushman Chucks

In order to avoid misunderstanding as to the meaning of the terms "outside" and "inside" as applied to chuck jaws, we have adopted the figures 1 and 2 to designate the types of jaws:

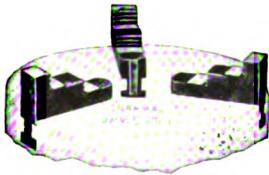


FIG. 3. JAWS No. 1



FIG. 4. JAWS No. 2

**NUMBER 1 JAWS**—These are most generally used. They have the steps going down toward the center of the chuck. With this type of jaw, pieces as large as the chuck itself may be held.

**NUMBER 2 JAWS**—Have the steps going down toward the periphery of the chuck. They will hold drills, rods, etc., up to size of the hole in the chuck body, but may be opened to hold short pieces of about one-half the diameter of the chuck body. With this style of jaw, rings, etc., may be held on the inside while the outside is being finished.

### Styles of Universal Geared Scroll Chucks

**STYLE B31**—Has three No. 1 jaws, making it adaptable for general lathe work. It will hold work as large as the diameter of the chuck body. It has three pinion gears in all sizes.

**STYLE B41**—Has four No. 1 jaws, otherwise is the same as style B31. It usually has two pinion gears, but some sizes may have three or more.

**STYLE B32**—Has three No. 2 jaws and is adapted to holding bars, rods, drills and special tools. The three steps may be used for holding rings, etc., on the inside. It has three pinion gears in all sizes.

**STYLE B42**—Same as style B32 except that it has four jaws. It usually has two pinion gears but some sizes may have three or more.

**STYLE B34**—Is furnished with two sets of jaws, one each of Nos. 1 and 2. The sets can be quickly and easily interchanged.

**STYLE B44**—Same as style B34 except that it has four jaws.

TABLE IV. CODE TABLE  
ALL UNIVERSAL SCROLL CHUCKS

Size <sup>*</sup> in.	CODE WORDS					
	Style B31	Style B41	Style B32	Style B42	Style B34	Style B44
3	PALATE	POCKET	PALM	POETESS	PANEL	POETRY
4	PAPER	POINTED	PARADE	POISON	PARASOL	POLARITY
5	PARDON	POLEMIC	PARK	POLISH	PARROT	POLITICS
6	PASSABLE	POLTOON	PASSPORT	POLYGON	PASTORAL	POMATUM
7 <sup>1</sup> / <sub>2</sub>	PATCH	POMPous	PATHETIC	PONTIFF	PATRIOT	PORLUCE
9	PEACEFUL	POPULATE	PEASANT	POROSITY	PEDAL	PORRINGER
10 <sup>1</sup> / <sub>2</sub>	PEEL	PORT	PEELER	PORTAL	PEERAGE	PORTIERE
12	PENALTY	PORTEND	PENITENT	PORTER	PENSIVE	POTHOLE
15	PERFECT	PORTICO	PERFUME	PORTLEY	PERSECUTE	PORTRAIT
18	PERCOLATE	POSER	PERDU	POSITION	PERFUSE	POSSESS
21	PERHAPS	POSSIBLE	PERIL	POSSUM	PERISH	POSTAL

\* For metric equivalents, see table III.

### Cushman Drill Chucks

These chucks are designed to withstand the hardest use. There are but four pieces in their construction, and these are of such shape that they are not easily broken, even through misuse. The jaws, of which there are two, interlock in a special manner and they will hold drills firmly without damage to the shanks.



FIG. 5. THE "HARTFORD" DRILL CHUCK

They are operated by a right and left screw, which is made of steel and is large in diameter.

The chuck is designed to be attached to the machine by means of a taper arbor for which a taper hole is provided in the hub. Chucks are sometimes threaded and screwed directly to the spindle. However, we do not recommend this method of attachment for the reason that the chuck cannot easily be repaired if the taper hole in the hub is changed in any way.

The "Hartford" Chuck may be used for a variety of purposes. It holds drills, rods, taps, reamers, etc., and, while designed for heavy work, it is equally adaptable to fine, accurate drilling and turning.

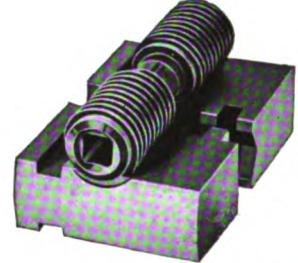


FIG. 6. DRILL CHUCK JAWS

TABLE V. APPROXIMATE DIMENSIONS

(1) Chuck No. ....	B0	B00	B1	B2	B3
(2) Capacity... in. (mm.)	0 to 1 <sup>1</sup> / <sub>2</sub> (0 to 6.3)	0 to 3 <sup>1</sup> / <sub>2</sub> (0 to 9.5)	0 to 1 <sup>1</sup> / <sub>2</sub> (0 to 12.7)	0 to 3 <sup>1</sup> / <sub>2</sub> (0 to 19)	1 <sup>1</sup> / <sub>2</sub> to 2 <sup>1</sup> / <sub>2</sub> (1.5 to 25)
(3) Diameter... in. (mm.)	1 <sup>1</sup> / <sub>2</sub> (41.3)	1 <sup>1</sup> / <sub>2</sub> (44.5)	2 <sup>1</sup> / <sub>2</sub> (54.0)	2 <sup>1</sup> / <sub>2</sub> (73.0)	3 <sup>1</sup> / <sub>2</sub> (92.1)
(4) Length... in. (mm.)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>1</sup> / <sub>2</sub> (66.7)	2 <sup>1</sup> / <sub>2</sub> (73.0)	3 <sup>1</sup> / <sub>2</sub> (85.7)	4 <sup>1</sup> / <sub>2</sub> (11.1)
(5) Weight... lb. (kg.)	1 <sup>1</sup> / <sub>2</sub> (0.57)	1 <sup>1</sup> / <sub>2</sub> (0.57)	2 <sup>1</sup> / <sub>2</sub> (1.13)	5 (2.27)	9 <sup>1</sup> / <sub>2</sub> (42.0)
(6) Code word....	SCANTLING	SCARAB	SEALING	SHADOW	SHATTER

## THE CUSHMAN CHUCK COMPANY

Established in 1862.  
HARTFORD, CONN., U. S. A.

## FABRICANTES DE MANDRILES PARA TORNOS Y PORTABROCAS.

Dirección Cablegráfica: "CUSHMAN", Hartford.  
Clave del Iron Age, en la Página 10.

## PRODUCTOS—Mandriles para Tornos y Portabrocas.

**CALIDAD:**—Los métodos modernos de que disponemos, junto con los muchos años de experiencia que tenemos, nos han puesto en condiciones de poder construir un mandril económico y garantizado de trabajar a entera satisfacción.

**DISPOSITIVOS PARA TORNOS:**—Si es cierto que un torno debiera equiparse para satisfacer el trabajo que se trata de ejecutar, creemos práctico recomendar el uso de dos mandriles: uno, tan grande como el volteo del torno lo permite, y el otro, más pequeño, tal vez la mitad del tamaño del anterior. El mandril mayor debiera tener cuatro mordazas independientes entre sí. Estas debieran ser macizas y reversibles, tal como el mandril independiente de cuatro mordazas que se muestra en la figura 1.

Este mandril debiera emplearse para sujetar piezas pesadas y de forma irregular ya se trate de debastar, fresar o bruñir. El mandril menor debiera tener tres mordazas de combinación con dos juegos de mordazas; uno para sujetar discos y el otro para varillas y brocas. Nuestro mandril universal, estilo 34, con engranajes espirales, es ideal para el objeto. Este mandril sujetará piezas redondas, firmes y concéntricamente.

Creemos que un torno así equipado, es capaz de ejecutar cualquier trabajo dentro de su capacidad. Un mandril universal sujetará mejor si está provisto de un número impar de mordazas, tres de preferencia. Un mandril de cuatro mordazas, puede emplearse solo cuando la pieza es perfectamente redonda, de otra manera, las cuatro mordazas no aplicarán uniformemente, y en tal caso, el esfuerzo será soportado solo por dos mordazas opuestas.

**MANDRIL INDEPENDIENTE DE 4 MORDAZAS. CONSTRUCCIÓN "CUSHMAN" ESTILO 812.** Este mandril está construido para sujetar piezas de cualquier forma, puesto que cada mordaza trabaja independientemente. Son de construcción fuerte y hechas de fundición gris de lo mejor. El hueco detrás del plato para el disco con rebordo, es de mayor diámetro para conseguir mayor rigidez cuando el disco atornilla con el cuerpo del mandril. Las canales en que resbalan las mordazas son extrafuertes y resistirán los mayores esfuerzos sin romperse o desgastarse. Las mordazas son de acero Siemens-Martin endurecido y ajustan exactas en el mandril.

Este mandril está hecho de manera que pueda sujetar piezas desde 25 hasta 101 mm. (1 a 4 pulg.) mayores que aquellas dimensiones para el cual el plato corriente está estipulado.

**Fig. 1. Mandril Independiente de 4 Mordazas de Construcción Cushman, Estilo B12.**

Las mordazas pueden abrirse más que ésto, pero en tal caso, algunos de los dientes de la mordaza quedan fuera de contacto, lo que viene a resultar en mayor trabajo para aquellos que quedan en contacto. Por regla general, la capacidad de los mandriles es poco mayor que su diámetro.

## TABLA I. ESPECIFICACIONES PARA LOS MANDRILES B12

**Mandriles "Cushman", universales con engranajes espirales.** Estos mandriles son universales en todo sentido de la palabra. El platillo espiral gira mediante piñones, los cuales se mueven mediante una llave.

**Fig. 2. Estilo B34 de Tres Mordazas.**

Las mordazas de acero ajustan perfectamente en el cuerpo del mandril y el diente curvado, engranará en las espirales del platillo, cualquiera que sea la posición de las mordazas.

## TABLA II. DIMENSIONES APROXIMADAS PARA TODOS LOS MANDRILES DE ENGRANAJES "CUSHMAN".

**MORDAZAS PARA MANDRILES "CUSHMAN":**—Con el objeto de eliminar equivocaciones con respecto al significado de la palabra "dentro" y "fuera" en su aplicación a las mordazas para mandriles, hemos hecho uso de los números 1 y 2 para denominar los tipos de mordazas.

**Fig. 3. Mordazas No. 1.**

**Fig. 4. Mordazas No. 2.**

Mordazas No. 1. Estas son las mordazas que más se usan. Tienen los escalones hacia el centro del mandril.

Mordazas No. 2. Estas tienen los escalones hacia afuera, y tienen piñones en todos los tamaños.

**ESTILOS DE MANDRILES UNIVERSALES DE ENGRANAJES: ESTILO B31.** Tiene tres mordazas del tipo No. 1, y está indicado para trabajos generales de torno. Puede sujetar trabajos tan grandes como el diámetro del mandril.

**ESTILO B41.** Este mandril tiene cuatro mordazas del No. 1, y en sus detalles es idéntico al B31.

**ESTILO B32.** Este tiene tres mordazas No. 2 y se presta para sujetar brocas, varillas, barras y herramientas especiales. Las tres gradas pueden emplearse para sostener por dentro anillos, etc. Todos los tamaños tienen tres piñones.

**ESTILO B34.** Viene con dos juegos de mordazas. Uno del No. 1 y otro del No. 2.

**ESTILO B44.** Igual al B34, con la diferencia de llevar cuatro mordazas.

## TABLA IV. CLAVE PARA TODOS LOS PLATOS UNIVERSALES DE ENGRANAJES ESPIRALES.

**PORTABROCAS "CUSHMAN" PARA TALADROS:**—Estos portabrocas están construidos para resistir un máximo de trabajo. La pieza completa se compone en total de cuatro partes y están hechas de tal manera que no se romperán fácilmente, aún si se les abusa.

Las mordazas, que son dos, trahan entre sí de un modo especial y sujetarán las brocas con firmeza sin destruir las espigas.

**Fig. 5. El Portabroca "Hartford" Para Taladros.**

## THE CUSHMAN CHUCK COMPANY

Maison Fondée en 1862

HARTFORD, CONN., ETATS-UNIS

## FABRICANTS DE MANDRINS

Adresse télégraphique: "CUSHMAN", Hartford

Code de l'Iron Age à la page 14

Autres codes employés: Lieber Standard, Western Union

## PRODUITS FABRIQUÉS:—Mandrins de Tours et Mandrins à Foret.

Notre longue expérience et l'emploi de méthodes de fabrications modernes nous permettent de fournir, à prix modéré, des mandrins garantis et satisfaisants à tous points de vue.

**ACCESOIRS DE TOURS.**—Quoique le choix d'un mandrin de tour dépend naturellement du travail à exécuter, nous pensons toutefois qu'en général, un tour devrait toujours être muni de deux mandrins, l'un correspondant à la capacité maximum du tour et l'autre, de taille environ moitié moins; il est désirable, que le gros mandrin soit pourvu de quatre mâchoires solides et reversibles comme le modèle à quatre mâchoires indépendantes de la figure 1; il devrait être employé pour l'usinage des pièces lourdes ou de forme irrégulière; le petit mandrin devrait être universel et à trois mâchoires et de plus, muni de deux jeux de mâchoires dont l'une employées pour serrer les pièces en fer en forme de disque et l'autre pour les tiges, forets, etc.; notre mandrin Universel, à serrage par spirale et engrenage, type B24 (fig. 2) est incomparable pour cet usage.

**AJUSTAGE DES MANDRINS SUR LE TOUR.**—La plupart de nos mandrins se montent sur le tour au moyen d'un plateau à queue filetée, qu'on visse sur l'arbre, puis qu'on tourne au diamètre de son logement à l'arrière du mandrin; les trous de boulons correspondants à ceux du mandrin sont ensuite percés aux points nécessaires.

**MANDRINS A QUATRE MACHOIRES INDEPENDANTES "CUSHMAN".** (Type B12).—Ce mandrin est très robuste, le corps est en fonte grise de bonne qualité, et il peut porter des pièces de toutes formes.

**Fig. 1. Mandrin à Quatre Mâchoires Indépendantes "Cushman", Modèle B12.**

Ce mandrin peut serrar des piezas d'un diamètre de 25 à 100 mm. plus grand que celui indiqué par la table, toutefois l'ouverture maximum ne doit pas dépasser le diamètre du plateau.

Nous possédons toute une série de mandrins spéciaux pour les diamètres supérieurs à 914 mm., et des mandrins à serrage puissant pour les faibles diamètres.

**TABLE I. SPECIFICATIONS POUR LE MANDRIN B12.**  
**TABLE II. MOTS DE CODE POUR LES MANDRINS SPECIFIÉS DANS LA TABLE I.**

## 204 GALLEY .

**MANDRIN UNIVERSEL A SERRAGE PAR SPIRALE ET ENGRANAGES, "CUSHMAN".**—Ces mandrins sont universels, les mâchoires sont serrées simultanément par un disque qui porte un filetage en spirale et qu'on peut faire tourner au moyen de roues dentées; les mâchoires ne sont pas reversibles, elles sont en acier y soigneusement ajustées dans leur logement, elles portent des dents courbes, taillées sur une machine spéciale et qui sont en prise avec le filetage en spirale du disque dans toutes les positions; toutes ces dents sont trempées et rectifiées.

**Fig. 2. Modèle B34 à Trois Mâchoires.**

**TABLE III. DIMENSIONS APPROXIMATIVES DES MANDRINS UNIVERSELLES A SERRAGE PAR SPIRALE ET ENGRANAGES.**—Lire de gauche à droite. Dimensions nominales. Alésage du mandrin. Diamètre du logement du plateau. Poids. Distance entre le fond du logement et la face du mandrin.

**MÂCHOIRES POUR MANDRIN "CUSHMAN".**—De façon à éviter tout malentendu sur la signification des termes extérieur et intérieur appliqués aux mâchoires de mandrin, nous avons adopté les appellations mâchoires No. 1 et mâchoire No. 2.

**Fig. 3. Mâchoire No. 1.**

**Fig. 4. Mâchoire No. 2.**

Les mâchoires No. 1 sont les plus employées, elles permettent de serrar les piezas d'un diamètre égal à celui du mandrin; les mâchoires No. 2 sont employées pour serrar les forets, des tiges, etc.; elles peuvent aussi tenir les anneauux par l'intérieur.

**DIFFERENTS MODELES DE MANDRINS UNIVERSELLES A SERRAGE PAR SPIRALE ET ENGRANAGES.**—Modèle B31 a trois mâchoires No. 1 employé pour tous travaux de tour en général. Modèle B41 similaire au modèle B31, mais à quatre mâchoires No. 1 au lieu de trois. Modèle B32 a trois mâchoires No. 2, employé pour serrar les barres, tiges, forets, etc. Modèle B42 similaire au modèle B32 mais à quatre mâchoires. Modèle B34, fourni avec deux jeux de mâchoires, un jeu No. 1 et un jeu No. 2. Modèle B44 similaire au modèle B34 mais à quatre mâchoires.

**TABLE IV. MOTS DE CODE POUR LES MANDRINS UNIVERSELLES A SERRAGE PAR SPIRALE ET ENGRANAGES.**—(Voir les valeurs métriques dans la table III du texte anglais).

**MANDRINS A FORET "CUSHMAN".**—Ces mandrins sont actionnés par une vis à filetage à droite et à gauche, l'arrière du mandrin est pourvu d'un trou conique, ce qui permet de se servir d'une broche cône pour le monter sur l'arbre de la machine.

**Fig. 5. Mandrin à Foret "Hartford".**

**Fig. 6. Mâchoires de Mandrin à Foret.**

**TABLE V. DIMENSIONS APPROXIMATIVES.**—(1) Numéro du mandrin. (2) Capacité d'ouverture. (3) Diamètre. (4) Longueur. (5) Poids. (6) Mat de code.